Washington State Wetland Rating System for Eastern Washington

Revised

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Ecology Publication # 04-06-15

WASHINGTON STATE WETLAND RATING SYSTEM

for

EASTERN WASHINGTON

Revised

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PREFACE

This document is a revision of the "Washington State Wetland Rating System for Eastern Washington," published by the Department of Ecology in October 1991. The original document was published with the understanding that modifications would be incorporated as we increase our understanding of wetland systems, and as the rating system is used by many different people.

The need to revise the original version became apparent as we have learned more about how wetlands function and what is needed to protect them, especially from the work done to develop methods for assessing wetland functions in the state. Furthermore, several textual inconsistencies and ambiguities were identified that made a consistent application of the ratings by different people difficult. Before undertaking the revisions, comments were sought from a wide range of users of the rating system.

Where possible the comments we have received to date have been incorporated in this revision.

ACKNOWLEDGEMENTS

This document would not have been possible without the participation and help of many people. Special thanks go to the technical committee of wetland experts and planners from local governments who helped develop the objectives for the rating system, reviewed the many drafts of the document, and helped field test the method. The list of participants in the review team is found in Appendix A. We have also received valuable comments from many who took the time to review the draft sent out for public comment, and we wish to acknowledge their efforts. In addition, the staff at the department of Ecology who deal with wetlands also provided much needed review and criticism, especially the regional staff (Cathy Reed and Mark Schuppe in the Central Regional Office and Chris Merker in the Eastern Regional Office).

1. INTRODUCTION

The wetlands in Washington State differ widely in their functions and values. Some wetland types are common, while others are rare. Some are heavily disturbed while others are still relatively undisturbed. All, however, provide some functions and resources that are valued. These may be ecological, economic, recreational, or aesthetic. Managers, planners, and citizens need tools to understand the resource value of individual wetlands in order to protect them effectively.

Many tools have been developed to understand the functions and values of wetlands. The methods range from detailed scientific analyses that may require many years to complete, to the judgments of individual resource experts done during one visit to the wetland. Managers of our wetland resources, however, are faced with a dilemma. Scientific rigor is often time consuming and costly. Tools are needed to provide information on the functions and values of wetlands in a time- and cost-effective way. One way to accomplish this is to categorize wetlands by their important attributes or characteristics based on the collective judgment of regional experts. Such methods are relatively rapid but still provide some scientific rigor (Hruby 1999).

The Washington State Wetland Rating System categorizes wetlands based on specific attributes such as rarity, sensitivity to disturbance, and functions. In the first edition, the term "rating" was not used in a manner that is consistent with its definition*, a wetland rating system should group wetlands based on an estimate of value or level of functioning on a scale (e.g. high, medium, low). The Washington State Rating System, however, categorizes wetlands based on several criteria such as rarity, sensitivity, and function that are not on the same scale. The term "rating", however, is being kept in the title to maintain consistency with the previous edition. Some local jurisdictions have adopted the rating system in their critical areas ordinances, and a change in title may complicate the use of this revised edition by these jurisdictions.

* rating – A position assigned on a scale; a standing.(American Heritage® Dictionary on Yahoo.com accessed August 2, 2004)

This rating system was designed to differentiate between wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the functions they provide. The rating system, however, does not replace a full assessment of wetland functions that may be necessary to plan and monitor a project of compensatory mitigation.

The "rating" categories are intended to be used as the basis for developing standards for protecting and managing the wetlands to reduce further loss of their value as a resource. Some decisions that can be made based on the rating include the width of buffers needed to protect the wetland from adjacent development, the ratios needed to compensate for impacts to the wetland, and permitted uses in the wetland. The Department of Ecology has developed recommendations for such protective standards and these are available on

the web at http://www.ecy.wa.gov/programs/sea/bas_wetlands/index.html).

The rating system is primarily intended for use with vegetated, freshwater, wetlands as identified using the State of Washington delineation method (WAC 173-22-035). The rating system, however, does not characterize many streambeds, riparian areas, and other valuable aquatic resources.

The rating system is not considered perfect, nor the final answer in understanding wetlands. It is however, based on the best information available at this time and meets the needs of "best available science" under the Growth Management Act. The development of the revised rating system involved the participation of a Technical Review Team consisting of wetland scientists and local planners from eastern Washington. A draft was also sent out for broad review to local planners, wetland scientists and the general public. We anticipate that the method will be further modified over time as we keep increasing our understanding of the wetland resource.

The current version of the rating system was field tested and calibrated in over 90 wetlands throughout eastern Washington. Members of the Technical Review Team and wetland staff from the Department of Ecology visited each site during the spring of 2002 and rated the wetlands using both the old and the revised methods. A companion document, "Washington State Wetland Rating System – Western Washington," is also available.

2. DIFFERENCES BETWEEN THE FIRST EDITION AND THE REVISED EDITION

In fine-tuning this version of the rating system the Department of Ecology is aware that many local governments are using the first edition, or some modified version of it, for managing their wetland resources. The Department's intention in revising the rating system has been to maintain the concept of four wetland categories, while adding refinements that reflect the progress made in understanding how wetlands function and are valued. Five of the original seven criteria for categorization (sensitivity to disturbance, rarity, Natural Heritage wetlands, ability to replace them, and the functions they provide) have been kept.

The other two original criteria for categorization, the presence of Threatened or Endangered (T/E) Species and "wetlands of local significance," have been dropped. The requirements for managing and protecting T/E species in a wetland are very species specific. Recommendations on buffers and mitigation ratios that result from this categorization are too generic to adequately protect a single species. For example, an increase in mitigation ratios and buffers that is usually assigned to wetlands of a "higher" category does not necessarily protect a specific T/E species from impacts**.**

Threatened and endangered species still need special protection, but this protection cannot be accomplished using the rating system. The department of Ecology does not have the expertise to specify standards for protecting each individual T/E species that might be found in a wetland. Local jurisdictions should consult with the appropriate state and federal agencies (U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, State Department of Fish and Wildlife) to develop standards for protecting T/E species using wetlands in their jurisdiction.

Protecting Threatened and Endangered Species in Wetlands

Threatened and endangered species need special protection, but this protection cannot be accomplished using the recommendations associated with the category rating of the wetland. If a T/E species is found living in or using a wetland, the appropriate state or federal agency will need to be consulted to determine what is needed to protect that species in the wetland. This information can be considered as an "overlay" on the category rating. A wetland containing T/E species will have to be protected to meet the requirements of the T/E species as well as those associated with its Category. If the T/E species using the wetland needs to be protected with larger buffers or by some other measures (e.g. no disturbance during the nesting season), then these measures will have to be applied.

For example, a category II riverine wetland that provides overwintering habitat for endangered Coho may need more than the standard buffers recommended for a Category II wetland to protect the fish.

Using "local significance" to determine a wetland category was also omitted from this revision because the criterion is rarely if ever used. Furthermore, the original edition of the rating system required that a local jurisdiction establish independent criteria for categorizing wetlands. The teams reviewing the rating system judged that if local

jurisdictions go to the trouble of identifying wetlands of local significance they will also establish standards for protecting and managing these special wetlands. The standards for protecting these wetlands can then be tailored to the specific values or functions that are of local significance, and do not need to be tied to the standards recommended for the rating system.

Information, however, about the presence of T/E species and characteristics that are of local significance is still important in making decisions about a wetland. For this reason, the rating form contains questions about these characteristics of a wetland. Although the information is not used to establish a category, they are data necessary for anyone trying to make decisions about the wetland.

Changes have also been made in the categorization based on how well a wetland performs different functions. The first edition focused on habitat functions because more was known, at that time, about habitat than the hydrologic or "water quality" functions. Our understanding of the latter functions, however, has increased significantly in the last decade, and we are in a position to now include indicators of hydrologic and "water quality" functions in the questionnaire. The categorization based on functions is now equally based on habitat functions, the hydrologic functions (flood storage and reducing erosion), and the functions of water quality improvement (sediment retention, nutrient removal, and removal of toxic compounds). Much of the information on wetland functions used in this version of the rating system was derived from the data and knowledge developed during the "Washington State Wetland Functions Assessment Project" (Hruby et al. 2000).

In the first edition of the rating system, wetlands with a high level of functions, but no other important attributes, could only rate a Category II or a Category III. In this edition, wetlands that are performing all three types of functions well can be rated a Category I. Conversely, wetlands performing all functions poorly are rated as a Category IV.

The Category IV rating based on how well a wetland functions has replaced the former criteria of Category IV based on isolation, size, and cover of invasive species. We now know that some small isolated wetlands are important in certain landscapes and should not be automatically rated as a Category IV.

The distribution of wetlands in different categories in the revised rating system

Data were collected at 90 wetlands to calibrate the revised rating system. At the same time, the wetlands were rated using the old system. The points assigned each question were calibrated to the scores and judgments of functioning developed for the Wetland Function Assessment Project (Hruby et al. 1999, Hruby et al. 2000). The thresholds (scores) for assigning categories, however, were chosen so the distribution of wetlands in the four categories remained roughly the same in the old and the revised system. Reviewers from local governments who participated in developing this draft did not want the relative proportion of wetlands in each category to change between the old and the revised versions. The following table compares the distribution of categories in the 90 reference wetlands using the old and the revised systems.

Number of Wetlands in Each Category

Category	Old Rating System	Revised Rating System
I	15	13
II	42	36
III	33	35
IV	0	6

3. RATIONALE FOR THE CATEGORIES

This rating system is designed to differentiate between wetlands based on their sensitivity to disturbance, rarity, the functions they provide, and whether we can replace them or not. The emphasis is on identifying those wetlands:

- where our ability to replace them is low,
- that are sensitive to adjacent disturbance,
- that are rare in the landscape,
- that perform many functions well,
- that are important in maintaining biodiversity.

The following description summarizes the rationale for including different wetland types in each category. As a general principle, it is important to note that wetlands of all categories have valuable functions in the landscape, and all are worthy of inclusion in programs for wetland protection.

3.1 CATEGORY I

Category I wetlands are those that 1) represent a unique or rare wetland type; or 2) are more sensitive to disturbance than most wetlands; or 3) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or 4) provide a high level of functions. We cannot afford the risk of any degradation to these wetlands because their functions and values are too difficult to replace. Generally, these wetlands are not common and make up a small percentage of the wetlands in the region. Of the 90 wetlands used to field test the current rating system only 13 (14%) were rated as a Category I. In eastern Washington the following types of wetlands are Category I.

Alkali wetlands - Alkali wetlands are characterized by the occurrence of shallow saline water. In eastern Washington these wetlands contain surface water with specific conductance that exceeds 3000 micromhos/cm. These wetlands provide the primary habitat for several species of migrant shorebirds and are also heavily used by migrant waterfowl. They also have unique plants and animals that are not found anywhere else in eastern Washington. For example, the small alkali bee that is used to pollinate alfalfa and onion for seed production lives in alkali systems. It is a valuable natural resource for agriculture in the western U.S. and especially in eastern Washington (Delaplane and Mayer, 2000). (Note: The "regular" bees used to pollinate fruits and vegetables are generally too large to pollinate the small flowers of these commercially important plants).

The salt concentrations in these wetlands have resulted from a relatively long-term process of groundwater surfacing and evaporating. These conditions cannot be easily reproduced through compensatory mitigation because the balance of salts, evaporation, and water inflows are hard to reproduce, and to our knowledge has never been tried. Alkali wetlands are also rare in the landscape of eastern Washington. Of the several

hundred wetlands that were surveyed and visited as part of the function assessment project and the revisions to the rating system, only nine could be classified as alkali.

Alkali wetlands are placed into Category I because they probably cannot be reproduced through compensatory mitigation and are relatively rare in the landscape. No information was found on any attempts to create or restore alkali wetlands. Any impacts to alkali wetlands will, therefore, probably result in a net loss of their functions and values.

Natural Heritage Wetlands – Wetlands that are identified by scientists of the Washington Natural Heritage Program/DNR as high quality, relatively undisturbed wetlands, or wetlands that support state Threatened, or Endangered plant species are Category I wetlands.

Extremely high quality, relatively undisturbed examples of wetlands are very uncommon in eastern Washington. By categorizing these wetlands as Category I, we are providing a high level of protection to the undisturbed character of these remaining high quality wetlands. Examples of undisturbed wetlands help us to understand natural wetland processes. Furthermore, the presence of rare plants in a wetland indicates unique habitats that might otherwise not be identified through the rating system. Rare plant populations are also sensitive to disturbance, particularly activities that result in the spread of invasive species.

The Washington Natural Heritage Program of the Department of Natural Resources (DNR) has identified important natural plant communities and species that are very sensitive to disturbance or threatened by human activities, and maintains a database of these sites.

"These natural systems and species will survive in Washington only if we give them special attention and protection. By focusing on species at risk and maintaining the diversity of natural ecosystems and native species, we can help assure our state's continued environmental and economic health." (DNR http://www.dnr.wa.gov/nhp/index.html, accessed October 1, 2002)

Bogs - Bogs are Category I wetlands because they are sensitive to disturbance and impossible to re-create through compensatory mitigation.

Bogs are low nutrient, acidic wetlands that have organic soils. The chemistry of bogs is such that changes to the water regime or water quality of the wetland can easily alter its ecosystem. The plants and animals that grow in bogs are specifically adapted to such conditions and do not tolerate changes well. Immediate changes in the composition of the plant community often occur after the water regime changes. Minor changes in the water regime or nutrient levels in these systems can have major adverse impacts on the plant and animal communities (e.g. Grigal and Brooks, 1997).

In addition to being sensitive to disturbance, bogs are not easy to re-create through compensatory mitigation. Researchers in Northern Europe and Canada have found that restoring bogs is difficult, specifically in regard to plant communities (Grosvermier et al. 1995, Schouwenaars 1995, Schrautzer et al. 1996), water regime (Grootjans and van Diggelen 1995, Schouwenaars 1995) and/or water chemistry (Wind-Mulder and Vitt 2000). In fact, restoration may be impossible because of changes to the biotic and abiotic properties preclude the re-establishment of bogs (Shouwenaars 1995, Schrautzer et al. 1996). Furthermore, bogs form extremely slowly, with organic soils forming at a rate of about one inch per 50 years in eastern Washington (Rigg 1958).

Nutrient poor wetlands, such as bogs, have a higher species richness, many more rare species, and a greater range of plant communities than nutrient rich wetlands (review in Adamus and Brandt 1990). They are, therefore, more important than would be accounted for using a simple assessment of wetland functions (Moore et al. 1989).

Mature and Old-growth Forested Wetlands with Slow Growing Trees – Mature and old-growth forested wetlands over ¼ acre in size dominated by slow growing native trees are "rated" as Category I because these wetlands cannot be easily replaced through compensatory mitigation. A mature forest of slow growing trees may require a century or more to develop, and the full range of functions performed by these wetlands may take even longer (see review in Sheldon et al. 2004, in press).

These forested wetlands are also important because they represent a second "priority habitat" as defined by the state department of Fish and Wildlife. "*Priority habitats* are those habitat types or elements with unique or significant value to a diverse assemblage of species." (Washington State Department of Fish and Wildlife (WDFW), http://wdfw.wa.gov/hab/phshabs.htm, accessed October 15, 2002). NOTE: All wetlands are categorized as a priority habitat by the WDFW. Forested wetlands, therefore, represent two priority habitats that coincide.

Wetland species considered to be "slow-growing" and native in eastern Washington are western red cedar (*Thuja plicata*), Alaska yellow cedar (*Chamaecyparis nootkatensis*), pine spp. mostly "white" pine (*Pinus monticola*), western hemlock (*Tsuga heterophylla*), Oregon white oak (*Quercus garryana*) and Englemann spruce (*Picea engelmannii*).

Forests with stands of Aspen – Aspen stands in a forested area are "rated" as Category I because their contribution as habitat far exceeds the small acreage of these stands and relatively small number of stems (Hadfield and Magelssen 2004). Furthermore a mature stand of aspen and its underground root system may be difficult to reproduce. Regeneration of aspen stands by sexually produced seeds is an unusual phenomenon (Romme et al. 1997).

Aspen stands are also important because they represent a second "priority habitat" as defined by the state department of Fish and Wildlife. "*Priority habitats* are those habitat types or elements with unique or significant value to a diverse assemblage of species." (Washington State Department of Fish and Wildlife (WDFW), http://www.wa.gov/wdfw/hab/phslist.htm, accessed October 15, 2002). NOTE: All wetlands are categorized as a priority habitat by the WDFW. Wetlands with aspen stands, therefore, represent two priority habitats that coincide.

Wetlands That Perform Many Functions Very Well - Wetlands scoring 70 points or more (out of 100) on the questions related to functions are Category I wetlands.

Not all wetlands function equally well, especially across the suite of functions performed. The field questionnaire was developed to provide a method by which wetlands can be categorized based on their relative performance of different functions. Wetlands scoring 70 points or more were judged to have the highest levels of function. Wetlands that provide high levels of all three types of functions (water quality improvement, hydrologic functions, and habitat) are also relatively rare. Of the 90 wetlands used to calibrate the rating system in eastern Washington, only 12 (13%) scored 70 points or higher. NOTE: There were 13 Category I wetlands overall in the 90 used to calibrate the method: 12 were categorized based

on function and 1 because it was an alkali wetland.

The questionnaire on wetland functions is based on the six-year effort to develop detailed methods for assessing wetland functions both in eastern and western Washington. These methods currently represent the "best available science" in rapid assessments of wetland functions.

3.2 CATEGORY II

Category II wetlands are difficult, though not impossible, to replace, and provide high levels of some functions. These wetlands occur more commonly than Category I wetlands, but still need a relatively high level of protection. Category II wetlands in eastern Washington include:

Forested Wetlands in the Floodplains of Rivers

Forested wetlands are an important resource in the floodplains of rivers, especially in the areas through which the river may flow regularly (often called the channel migration zone). These wetlands are rated Category II, at a minimum, because the questionnaire on functions does not adequately capture their unique role in the ecosystem. Trees in the floodplains are critical to the proper functioning and the dynamic natural processes of rivers. Please note, however, that many forested wetlands in floodplains that have structurally complex habitats may actually be a Category I based on the functions.

Trees in floodplains "are a primary factor influencing channel form, creating the pools, riffles and side channels that are essential habitat for many fish and other aquatic species. Erosion is buffered by tree roots and large organic debris introduced into channels through erosion and windfall. Large woody debris forms stable associations when trapped within side channels, and functions to minimize bank erosion, dissipate channel energy, meter flow down the side channels, create localized rearing and flood refuge areas, and contribute to the stabilization of the main river channel." (Gorsline, J. http://www.brinnoninfo.com/channelmigration.htm, accessed October 15, 2002).

Mature and Old-growth Forested Wetlands with Fast Growing Trees

Mature and old-growth forested wetlands with over ¼ acre of forest dominated by fast growing native trees are "rated" as Category II because they are hard to replace within the time-frame of most regulatory activities. The time needed to replace them is shorter than for forests with slow growing trees, but still significant. These forested wetlands are also important because they represent a second "priority habitat" as defined by the Washington state Department of Fish and Wildlife. NOTE: All wetlands are categorized as a priority habitat by the WDFW. Forested wetlands, therefore, represent two priority habitats that coincide.

Native fast-growing wetland trees include:

Alders – Red (*Alnus rubra*), Thin-leaf (*A. tenuifolia*);
Cottonwoods – Narrow-leaf (*Populus angustifolia*), Black (*P. balsamifera*);
Willows- Peach-leaf (*Salix amygdaloides*), Sitka (*S. sitchensis*), Pacific (*S. lasiandra*); and Aspen - (*Populus tremuloides*)
Water Birch (*Betula occidentalis*)

Vernal Pools – Vernal pools, or "rainpools," located in a landscape with other wetlands and that are relatively undisturbed during the early spring are rated Category II because the questionnaire on functions does not adequately capture their unique role in the ecosystem.

Vernal pool ecosystems are formed when small depressions in the scabrock or in shallow soils fill with snowmelt or spring rains. They retain water until the late spring when reduced precipitation and increased evapotranspiration lead to a complete drying out. The wetlands hold water long enough throughout the year to allow some strictly aquatic organisms to flourish, but not long enough for the development of a typical wetland environment (Zedler 1987).

The Washington Natural Heritage Program (WNHP) has recognized the vernal pool ecosystem as an important component of Washington's Natural Area System. Vernal pools in the scablands are the first to melt in the early spring. This open water provides areas where migrating waterfowl can find food while other, larger, bodies of water are still frozen. Furthermore, the open water provides areas for pair bonding in the waterfowl (R. Friesz, WDFW, personal communication). Thus, vernal pools in a landscape with other wetlands provide an important habitat function for waterfowl that requires a relatively high level of protection. This is the reason why relatively undisturbed vernal pools in a mosaic of other wetlands are Category II, and isolated undisturbed vernal pools are Category III.

Wetlands That Perform Functions Well - Wetlands scoring between 51-69 points (out of 100) on the questions related to the functions present are Category II wetlands. Wetlands scoring 51-69 points were judged to have relatively high levels of function for most functions, or performed one group of functions very well and the other two moderately well.

3.3 CATEGORY III

Category III wetlands are 1) vernal pools that are isolated, and 2) wetlands with a moderate level of functions (scores between 30 -50 points). Wetlands scoring between 30 -50 points generally have been disturbed in some ways, and are often smaller, less diverse and/or more isolated from other natural resources in the landscape than Category II wetlands.

3.4 CATEGORY IV

Category IV wetlands have the lowest levels of functions (scores less than 30 points) and are often heavily disturbed. These are wetlands that we should be able to replace, and in some cases be able to improve. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands may provide some important functions, and also need to be protected.

4. OVERVIEW FOR USERS

4.1 WHEN TO USE THE WETLANDS RATING SYSTEM

The rating system is designed as a rapid screening tool to categorize wetlands for use by agencies and local governments in protecting and managing wetlands. It should be used only on vegetated wetlands as defined using the delineation procedures in WAC 173-22-80. The rating system does not try to establish the economic values present in a wetland; it only helps to identify its sensitivity, rarity, and functions.

Two versions of the rating system have been developed, one for eastern Washington and one for western. This broad division of the state into east and west may not reflect all regional differences in the importance of wetlands Developing special measures to protect locally unique wetlands is recommended where local governments need to provide a level of protection that would not be otherwise provided by the rating system.

4.2 HOW THE WETLAND RATING SYSTEM WORKS

The first edition of the rating system had two forms that needed to be filled out, the "office" form and the "field" form. This revision only has one form, the "rating" form. The information that was incorporated in the "office" form is now included on the first page of the rating form.

The Wetlands Rating Form attached at the end of this document asks the user to collect information about the wetland in a step-by-step process. We recommend careful reading of the guidance before filling out the form. The wetland rating can be based on different criteria, so it is important to fill out the entire rating form. Since a wetland may rate a different category for each criterion, it is the "highest" that applies to the wetland. "Highest" here is defined as the most protective.

4.3 GENERAL GUIDANCE FOR THE WETLAND RATING FORM

Land-owner's Permission

It is important to obtain permission from the land owner(s) before going on their property.

Time Involved

The time necessary to rate wetlands will vary from as little as fifteen minutes to several hours. Larger sites with dense brush may involve strenuous effort. Several of the rating questions are best answered by using aerial photographs, topographic maps, other documents, or a combination of these resources with field observations.

Experience and Qualifications Needed

It is important that the person completing the rating have experience and/or education in the identification of natural wetland features, indicators of wetland function, vegetation classes, and some ability to distinguish between different plant species. We recommend that qualified wetland consultants or wetland experts be used to rate most sites, particularly the larger and more complex ones.

Identifying the Boundaries of Wetlands for Rating

First, determine the location and approximate boundaries of the wetland during the site visit. A surveyed delineation of the wetland, however, is not necessary to complete data collection, unless this information is required for another part of your project. It is often useful to have a map or aerial photograph on which the approximate boundaries of the wetland can be drawn. This boundary, however, will need to be verified in the field. A determination of the boundary that is not verified by a field survey may result in a different rating. This is especially true in forested wetlands where the boundaries are difficult to determine from aerial photographs.

The entire wetland within the delineated boundary is to be rated. Small areas within a wetland (such as the footprint of an impact) cannot be rated separately. The rating method is not sensitive enough, or complex enough, to allow division of a wetland into sub-units based on level of disturbance, property lines, or vegetation patterns. Furthermore, users of the rating system are not asked to subdivide a wetland into different wetland classes (hydrogeomorphic (HGM) classes, see p. 21) as is done in the function assessment methods. A wetland with several wetland classes within its boundary is treated as one class for the purpose of rating. The second page of the rating form provides guidance on how to classify for wetlands having several HGM classes within its boundary.

Identifying Boundaries of Large Contiguous Wetlands in Valleys

Wetlands can often form large contiguous areas that extend over hundreds of acres. This is especially true in river valleys where there may be some surface water connection between all areas of the floodplain or along the shores of a lake. In these situations the initial task is to identify the wetland "unit" that will be rated. For the purposes of the rating system, a large contiguous area of wetland can be divided into smaller units using the criteria described below.

The guiding principle for separating a vegetated wetland into different units for the purpose of rating is changes in the water regime of the wetland. Boundaries between different units should be set at the point where the volume, flow, or velocity of the water changes rapidly, whether created by natural or human-made features. The following sections describe some common situations that might occur. The criteria for separating wetlands into different units for rating are based on the observations made during the field work undertaken to calibrate both the rating system and the methods for assessing wetland functions. They reflect the collective judgment of the teams of wetland experts that developed and calibrated the methods.

Examples of Changes in Water Regime

- *Berms, dikes, cascades, rapids, falls, culverts, and other features that change flow, volume, or velocity of water over short distances.*
- *The presence of drainage ditches that significantly reduce water detention in one area of a wetland.*

Wetlands in a Series of Depressions in a Valley

Wetlands in depressions along stream or river corridors may contain constrictions where the wetland narrows between two or more depressions. The key consideration is the direction of flow through the constriction. If the water moves back and forth freely it is not a separate unit. If the flow is unidirectional, down-gradient, with an elevation change from one part to the other, then a separate unit should be created. The justification for separating wetlands increases as the flow between two areas becomes more unidirectional and has a higher velocity. Constrictions can be natural or man-made (e.g. culverts). (Figure 1)

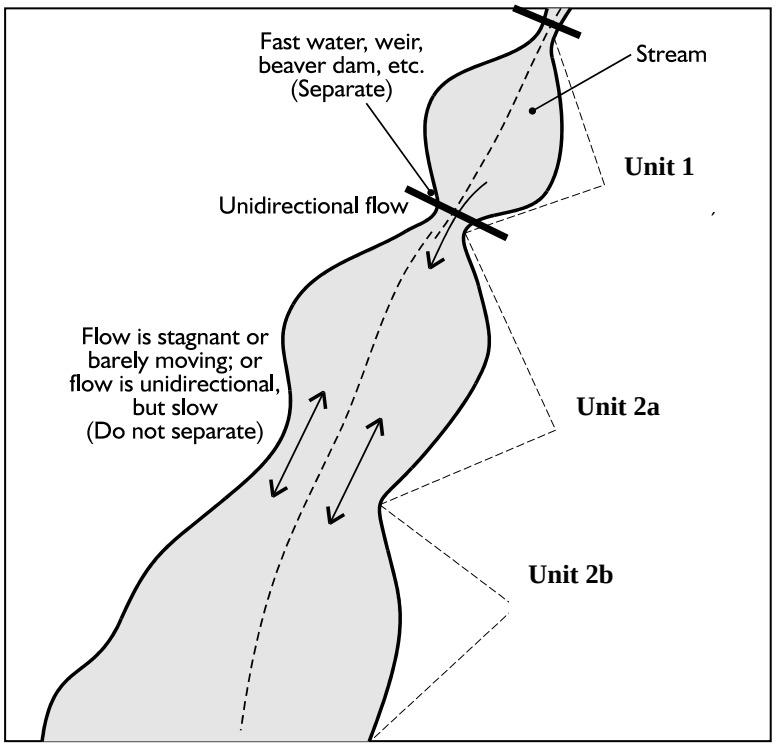
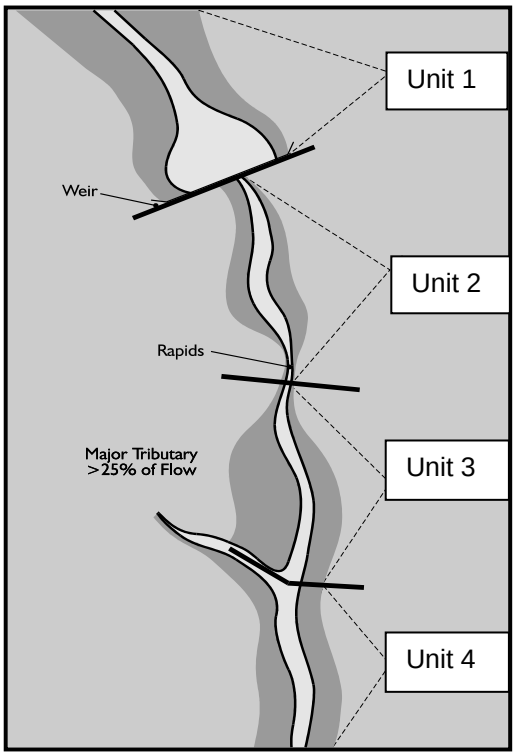


Figure 1. Determining wetland units for rating along a stream corridor with constrictions. Units 2a and 2b should be rated as one larger unit.

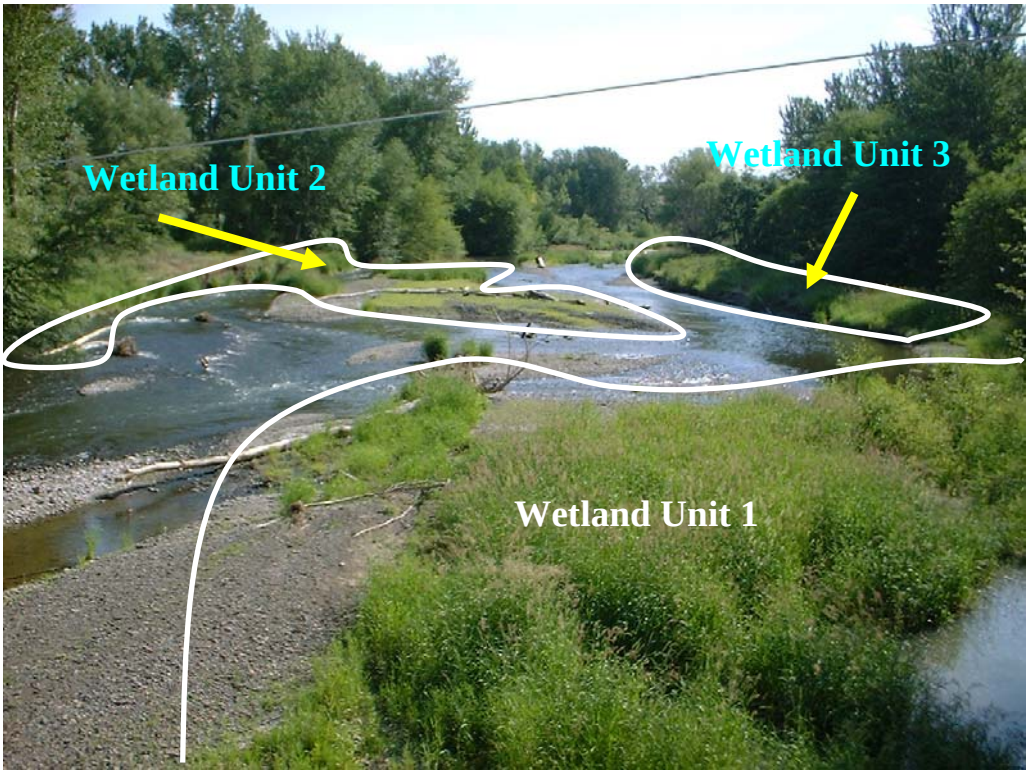
Wetlands Associated with Streams or Rivers



In eastern Washington, linear wetlands contiguous with a stream or river may be broken into units at the point where the wetland vegetation 1) disappears and is replaced with unvegetated bars, 2) becomes narrow for at least 100 (40 m) feet along the stream corridor, or 3) where the water regime changes. A narrow band of vegetation is defined as one that is less than 5 feet in width. Figures 2 and 3 present diagrams of how riverine wetlands might be separated into different units based on changes in water regime and width of vegetation.

Figure 2: Determining wetland units in a riverine system based on changes in water regime.

Figure 3: Determining wetland units in a riverine setting based on breaks in vegetation.



In cases when a wetland contains a stream or river, you must also decide if the stream or river is a part of the wetland. Use the following guidelines to make your decision:

Wetland on one side only — If the wetland area is contiguous to, but only on one side of, a river or stream, *don't* include the river as a characteristic of the wetland for rating.

Wetland on both sides of a wide stream or river — If there is a contiguous vegetated wetland on both sides of a river where the unvegetated channel is greater than 17 ft. (5m), consider **each side as a separate unit**. (see Figure 3 above). **Do not** include the river as a characteristic of the wetland unit for rating.

Wetland on both sides of a narrow river or stream — If the river or stream has an unvegetated channel less than 17 feet (5 m) wide, and there is a contiguous vegetated wetland on both sides, **treat both sides together** as one unit and **include** the river or stream as a characteristic of the wetland.

Identifying Wetlands in a Patchwork on the Landscape (Mosaic)

If the wetland being categorized is in a mosaic of wetlands, the entire mosaic **should be considered one unit** when:

- Each patch of wetland is less than 1 acre (0.4 hectares), and
- Each patch is less than 100 ft (30 m) apart, on the average, and
- The areas delineated as vegetated wetlands are more than 50% of the total area of both wetlands and uplands, or wetlands, open water, and river bars.

If these criteria are not met, each area should be considered as an individual unit (see Figure 4).

NOTE: One of the most common "patchwork" landscapes in eastern Washington is one formed by riparian wetlands in the floodplains of rivers and streams. In this landscape, vegetated wetlands, as defined by the delineation manual, are interspersed with "uplands" of cottonwood or willow. In this case use the criteria above. Treat the entire area as a wetland if the areas that meet the criteria for wetlands are greater than 50% of the total area. In this landscape the cottonwoods growing outside the wetland patches should be included as features of the wetland. Such wetlands should be treated as riparian forested wetlands for the purpose of rating them (see p. 86).

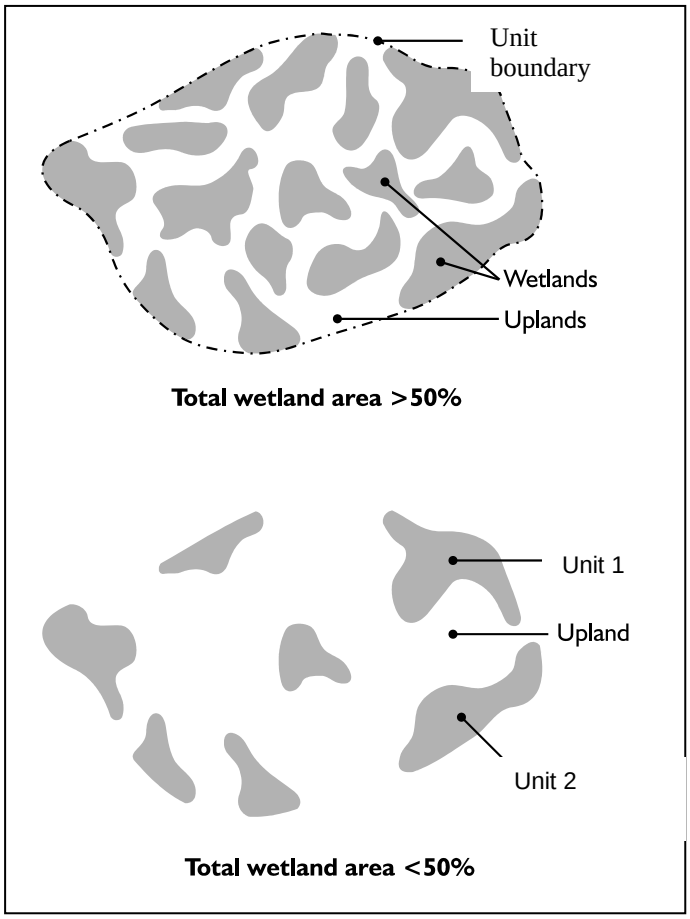


Figure 4: Determining unit boundaries when wetlands are in small patches.

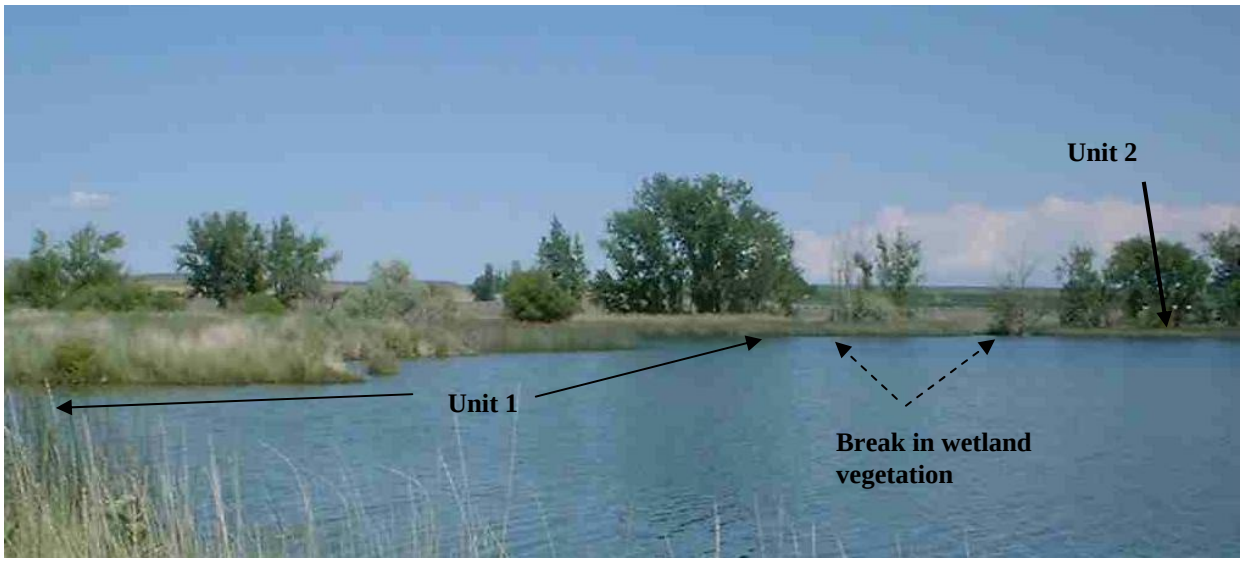
Identifying Boundaries Along the Shores of Lakes or Reservoirs (Lake-fringe wetlands)

Lakes or reservoirs will often have a fringe of wetland vegetation along their shores. Different areas of this vegetated fringe can be categorized separately if there are gaps where the wetland vegetation disappears or where the band of vegetation is very narrow. Use the following criteria for separating different units along a lakeshore.

NOTE: If the open water is less than 20 acres, the entire area (open water and any other vegetated areas) is considered as one wetland unit, and it is a depressional or riverine wetland.

1. Only the vegetated areas along the lake shore are considered part of the wetland unit for the rating system. Open water between areas of vegetation is considered to be part of the lake.
2. If only some parts of the circumference of a lake are vegetated, separate the vegetated parts into different units at the points where the wetland vegetation thins out to less than a foot in width for at least 33ft (10m). (Figure 5)

Figure 5: Break in wetland vegetation along the shore of a lake that separates the wetlands into two units for rating.



Wetlands Bisected by Human-Made Features

When a wetland is divided by a human-made feature, for example a road embankment, the wetland should not be divided into different units if there is a level surface-water connection between the two parts of the wetland. Water should be able flow equally well between the two areas. For example, if there is a wetland on either side or a road with a culvert connecting the two, and both sides of the culvert are partially or completely underwater, the wetland should be rated as one. Make the down gradient wetland a separate unit, however, if the bottom of the culvert is above the high water marks in the receiving wetland, or the high-water marks on either side differ by more than 6 inches in elevation.

Cases when a Wetland Should Not be Divided

Differences in land uses within a wetland should not be used to define units, unless they coincide with the circumstances described above. For example, if half a wetland has been recently cleared for farming and the other half left intact, the entire area functions as, and should be categorized as, one unit.

Large Wetlands where only part of the Wetland is Forested or a Bog

Large wetlands may be rated as Category I because they contain a smaller area of bogs or slow-growing forest. If the entire wetland (including the bog and forested areas) scores between 30 and 69 points for its functions (scores for a Cat II or Cat III wetland), it may be possible to assign a dual rating to the wetland (e.g. Category I/II). Table 1 identifies the cases when dual ratings are possible.

Table 1: Situations where dual ratings may be possible.

Rating Based on Special Characteristics	Score for Functions >= 70	Score for Functions 51-69	Score for Functions 30-50
Cat. I bog	Not possible – Cat. I	I/II	I/III
Cat. I forest	Not possible – Cat. I	I/II	I/III
Cat II forest	Not possible – Cat. I	Not possible – Cat. II	II/III

To develop a dual rating you will need to establish a boundary within the wetland that clearly establishes the area that is the Category I bog or forest or the Category II forest. If you are unable to clearly map the boundaries between the forest or bog and the rest of the wetland it may be impossible to assign a dual rating.

Dual ratings are acceptable only in the case a wetland contains a smaller area of bog or forest. **Wetlands that are a Category I Natural Heritage sites, Category I alkali wetlands, or Category II vernal pools cannot be split.**

The criteria to be used in establishing the boundary between the Category I part of a wetland and the part that is either Category II or III are as follows:

1. For wetland areas that are Category I as a result of the presence of a forest, the boundary between categories should be set at the edge of the forest.
2. For wetland areas that are Category I because they are bogs, the boundary between categories should be set where the characteristic bog vegetation changes (i.e. most of the plants that are specifically adapted to bogs are replaced with the more common wetland species) and/or where the organic soils become shallow (less than 16 inches).

Very Small Wetlands

Users of the rating system often question the effectiveness of the method at rating wetlands that are ¼ acre or less. One tree or shrub may be all that is needed in a small wetland to score points on the data sheet for certain questions. The data collected during the calibration of the method, however, indicate that wetlands smaller than a quarter acre can be rated accurately. The smallest wetlands rated during the calibration were about 1/10 acre in size (see Figure 7 for a example of a small wetland that is about 1/10 acre in size), and all were judged by the field teams to be adequately characterized using the method. Vernal pools were found that were even smaller than this, on the order of 100-200 square feet. These however, were not rated based on their functions using questions about the structure of the wetland.

At present, the accuracy of the ratings has not been tested for wetlands smaller than 1/10 acre, but it may be applicable to even smaller wetlands because the rating of most functions is not dependent on the size or number of characteristics in the wetland. The scoring for the “water quality” functions is independent of size because the functions are rated on the "potential" per unit area. For example the ability of a square yard of organic soil in a wetland to remove nitrogen is not dependent of the size of the wetland. A square

yard of soil in a wetland of 1/10 acre can be just as effective as a square yard in a large wetland if it undergoes seasonal ponding.

The same is true for the hydrologic functions. A small wetland that stores 3 ft of water during a flooding event is more effective, on a per acre basis, than a large wetland that stores only 1ft. The larger wetland may store a larger volume overall, but it is the volume per unit area that needs to be characterized. Impacts to wetlands are usually calculated by area. For example, an impact to 1/10 acre of a wetland that stores 3 ft of water needs to be mitigated by replacing a similar amount of storage (i.e. 3 ft over 1/10 acre). It makes no difference if the wetland impacted is ¼ acre, 10 acres, or 100 acres in size.

Very small wetlands may not provide good habitat for some of the larger wildlife species such as otter or beaver, but they are known to provide critical habitat for many smaller species. For example, amphibians were found using and breeding in wetlands as small as 270 ft^2 in the Palouse region of northern Idaho (Monello and Wright 1999). Vernal pools as small as 200 ft^2 are used by migrating waterfowl in the Columbia Basin (R. Friesz, personal communication, also droppings of waterfowl were observed around the edges of the vernal pools shown in Figures 38 and 39).

Thus, very small wetlands may be less important for large wildlife but more important for smaller wildlife. Since the methods were judged to be accurate for wetlands as small as a 1/10 of an acre, the review team and the department of Ecology staff decided not to develop a separate rating system for very small wetlands less than 1/10 acre in size.